

ON A COLLECTION OF THYSANOPTEROUS INSECTS FROM BARBADOS AND ST. VINCENT ISLANDS.

By HENRY JAMES FRANKLIN,

Of the Massachusetts Agricultural College, Amherst.

Most of the specimens on which this paper is based were collected in different parts of Barbados Island during the summer of 1905 by Mr. C. C. Gowdey, a student in the Massachusetts Agricultural College. The facts concerning localities, food, plants, dates of capture, etc., were also supplied by Mr. Gowdey.

Of the eleven districts in the island, three, namely, St. Michael, St. Thomas, and St. Peters are represented, there being in all 316 specimens from Barbados, representing 9 species of which 4 appear to be new to science. Thirty-four specimens of *Heliothrips* are from the island of St. Vincent, having been collected there in March, 1905, by Mr. H. A. Ballou, Government Entomologist, British West Indies. As the Thysanoptera in this part of the world have received little attention the collection is interesting, not only on account of the new forms which it contains but also because of the added knowledge which it furnishes concerning the distribution of those already known. Two of the species more commonly found here are most closely allied with very well-known and common European forms. It may also be mentioned that *Heliothrips hæmorrhoidalis*, so abundant in a large portion of the world, is represented by numerous specimens, and three species, so far as known, restricted to the Western Hemisphere, are also present.

Family ÆOLOTHRIPIDÆ.

Of this family there is but a single immature specimen which I have been unable to determine with certainty.

Family THRIPIDÆ.

This family is represented by four species, as follows:

1. EUTHRIPS INSULARIS, new species.

Plate LXIII, figs. 1, 2, 3, 5, 6, 7; Plate LXV, figs. 19, 24.

Female.—Length, 1.43 mm. to 2.12 mm.; width of mesothorax, 0.31 mm. to 0.43 mm.; greatest width of abdomen, 0.33 mm. to 0.45 mm. General color brown.

Head from $1\frac{2}{7}$ to $1\frac{1}{2}$ times as wide as it is long; widest across the eyes, very slightly narrowed behind; square in front. Vertex slightly elevated between the bases of the antennæ. A rather conspicuous ridge runs transversely across the back of the head at some distance behind the eyes. There are, besides this, a few other similar but much less conspicuous ridges running parallel with it on the same general part of the head. Eyes large (occupying together about two-thirds the width of the head), conspicuous and with a slight tendency to protrude. Ocelli fully as large as the facets of the eye, and well separated; the two posterior ones almost touching the margins of the eyes; yellow in color and bordered with dark reddish crescents. Cheeks nearly straight, bulging but slightly. Spines between ocelli on each side long and conspicuous; postocular spines shorter but yet very prominent. Face (ventral view of head, fig. 5) with a large and conspicuous spine on each side of the middle at some distance behind the eyes also with a rather conspicuous pair, the two nearer the middle line especially so, between the eyes and placed at some distance back from the bases of the antennæ. On each side of the head, behind the eye, there is also a rather noticeable spine. On each side, in front of the anterior ocellus, there is a small but characteristic spine. There are other spines on the head, both above and below, but these are the most remarkable. Mouth cone pointed and rather slender, reaching back two-thirds across the prosternum; maxillary palpi three segmented, the basal segment being fully twice as thick as the apical one. Antennæ about as long as the head and prothorax taken together, inserted a little below the margin, their bases separated by little more than one-fourth the thickness of the basal segment; relative lengths of segments as follows:

Number of segment.....	1	2	3	4	5	6	7	8
Spaces of micrometer covering it.....	9.5	13.8	20.3	19.9	15	20	4.7	5.1

The three basal segments thickest, the first being thicker than the second and the second thicker than the third; fifth and sixth subequal. First segment rounded conical in form, somewhat thicker than long; second cup-shaped, the third and fourth fusiform. Spines on the antennæ for the most part quite strong and conspicuous, dark colored. Sense organs well developed; cones on segments three and four forked. Color of segment one and two brown; three and four yellow, four slightly tinged with brown on its apical half; five yellow at base, light grayish brown at apex; six, seven, and eight grayish brown.

Prothorax rounded, one and one-half times as broad as long; about one and one-fourth times as wide as the head; from 1.15 to 1.3 times as long as the head; bearing a pair of long stout spines at each angle of the notum; also one short anteriorly directed spine standing close to

the lower one of each anterior pair. Between the upper spines of the anterior pairs there are two much smaller ones near the anterior border of the prothorax, one on each side of the middle line. Between the two upper spines of the pairs on the posterior angles a row of shorter ones runs along the hind border; of these the second from the median line on each side is much the stoutest and longest. Color of prothorax a somewhat lighter brown than that of the head, about like that of the pterothorax and abdomen. Mesothorax about one and one-half times as wide as the prothorax; mesonotal plate with one strong and conspicuous spine on each lateral angle and with one median and two lateral spines on each side near the posterior margin. Mesosternum with one long conspicuous spine on each side, placed near the lateral angle. Metathorax tapering slightly but distinctly posteriorly, distinctly narrower than mesothorax; width at posterior end only about four-fifths the greatest width of the mesothorax. Endothoracic invagination of metathorax Y shaped. Metasternum with a long conspicuous spine somewhat behind the middle on each side. Metanotal plate bearing four spines at the anterior edge, the middle pair being very much more stout and conspicuous.

Wings about reaching the anterior margin of the seventh abdominal segment; breadth at middle about one-twelfth their length; somewhat shaded with brown except the basal fourth which is clear; scale often shaded somewhat as well as the costa at the base; fringes of both the fore and hind wings rather strongly stained with brown. Each fore wing has two longitudinal veins extending from base to tip which bear spines at regular intervals as follows: Costa 22 to 28; fore vein 20 to 23; hind vein 15 to 18; scale 5, besides a pair at the tip; a light sparse fringe on costal border of each wing; posterior fringes long, heavy, and with the individual hairs quite crinkly in the middle. Wings bearing, besides the spines and fringes, numerous minute spines arranged in rows which run lengthwise of the wing. General surface of the legs with a considerable number of spines; each tibia with a pair at its extremity; posterior tibiæ each with a conspicuous longitudinal comb-like row of seven or eight rather stout spines on the inner side; posterior tarsi with the basal segment of each bearing several spines at its distal end. Coxæ and femora brown, sometimes very light, the anterior pair tipped slightly with yellow. Fore tibiæ yellow, middle and hind tibiæ deep brown, sometimes slightly tipped with light yellow; all the tarsi light yellow, with a small but conspicuous dark spot on their inner sides toward their tips.

Abdomen elongate ovate in general outline, at base only about three-fourths as wide as the metathorax, widest at fifth and sixth segments, pointed at apex, two and one-half to three times as long as broad, brown and with brown spines, those toward the tip being long

and heavy, tenth segment with apical three-fourths split above. Each ventral abdominal plate in front of the base of the ovipositor, except segments one and two, with a transverse row of six prominent spines on the posterior border, three on each side of the middle line. Posterior border of the eighth dorsal plate denticulate. Ventral pleural plates strongly denticulate behind. Each dorsal pleural plate with a strong spine on its lower posterior corner.

Type.—Cat. No. 11360, U.S.N.M.

Described from fifteen females (cotypes), of which six (one slide) are deposited in the collection of the United States National Museum and the remaining nine (three slides) in the collection of the Massachusetts Agricultural College. There are also numerous paratypes in the collection of the latter institution.

Male.—Length, 0.96 mm. to 1.5 mm.; width of head, 0.17 mm. to 0.22 mm.; width of prothorax, 0.18 mm. to 0.28 mm.; width of mesothorax, 0.23 mm. to 0.38 mm.; greatest width of abdomen, 0.21 mm. to 0.32 mm. Color gray-brown to brown, generally lighter than the female; head and apical segments of the abdomen the darkest portions; pterothorax generally lightest. Antennæ about two and one-third times as long as the head; relative lengths of segments as follows:

1	2	3	4	5	6	7	8
7.8	9.8	15.2	15.2	11.4	14.4	3.1	3.8

Wings reaching but little beyond the anterior border of the seventh abdominal segment.

The third to seventh, inclusive, ventral abdominal plates each with a transverse sole-shaped marking in the middle, this marking being about one-half as long as the plate is wide. Abdomen widest at the fourth segment. Anterior femora thickened, about two-fifths as wide as the head, proportionally thicker than in the female. On the middle of each side and on each posterior angle of the ninth abdominal segment is a very large strong spine, and a similar one is present on each posterior dorsal angle of the tenth segment. All these spines, as well as most of the others of any prominence on the apical segments, are dark colored.

Described from thirteen specimens (cotypes) of which four (two slides—one of these being the slide which has the female type specimens) are deposited in the collection of the United States National Museum and the remaining nine (five slides) in the collection of the Massachusetts Agricultural College.

Food plants.—Black willow, *Bonaviste* (a legume), eddoe (a variety of yam), bean, roses (several varieties), guinea grass, potato, papaw, pepper, tobacco, white wood, *Cordia* (red), woolly pyrol, *Convolvulus*, ground nut, arrow root, yam, flamboyant. Usually found on flowers and in colonies.

Specimens taken at Glendor, St. Michael; Newstead, St. Peters; Cane Garden, St. Thomas; Spring, St. Thomas; St. Anns, St. Michael; Belle, St. Michael; Bellevue, St. Michael; Walmoral Lodge, St. Michael. Dates of capture range from July 20 to September 5.

This species is most closely allied to the European *Euthrips vulgatissimus* (Haliday). It may, however, be separated from that species by the presence of postocular bristles and by the color of the males. This appears to be the most common species in Barbados, as it is represented in the collection by 135 females and 47 males.

An unusual deformity is the double front ocellus seen in one of the males.

2. EUTHRIPS TRITICI (Fitch).

Of this species there are 64 females and 20 males in the collection. It seems to be the second most abundant species in the island. In Barbados this insect was taken on the following new food plants: Black willow, tomato, frangipani, papaw, watermelon, cotton, horse-radish tree, *Hibiscus*, *Crotolaria*, white wood, bean, *Ipomea*, Bermuda lilies, and eddoe (a variety of yam).

Specimens taken at St. Anns, Belle, Glendor, Bellevue, Waterford, Pine Estate, and Walmoral Lodge, St. Michael; Cane Garden and Spring, St. Thomas; Newstead, St. Peters. On flowers and leaves, often in colonies. Dates of capture ranging from July 12 to August 22.

3. HELIOTHRIPS HÆMORRHOIDALIS (Bouché).

This species is represented by 27 females and several larval specimens. A common greenhouse pest in Europe and the United States, and in those parts of the world confined almost entirely to greenhouses. This species is found in the open in St. Vincent and Barbados. It is evidently a tropical species. Some of its food plants in St. Vincent are cacao, and kola, and in Barbados it is found on date palms.

Specimens taken on St. Vincent and at Glendor, St. Michael, Barbados. Insects found in colonies on leaves and flowers.

The larvæ of this species, at least as they approach maturity, are yellow in color and have the abdomen for the most part covered over with small, wart-like elevations. Most of the hairs on the body, except at the tip of the abdomen, are knobbed. The apical abdominal segments are somewhat tubular, and thus present an appearance similar to that seen in the Phlœathripidæ. These apical segments are usually slightly stained on the sides with brown.

4. HELIOTHRIPS RUBROCINCTUS (Giard).

Plate LXIV, figs. 10, 14; Plate LXV, figs. 17, 20, 21.

Female.—Length, 0.92 mm. to 1.42 mm.; width of head, 0.16 mm. to 0.23 mm.; width of prothorax, 0.20 mm. to 0.25 mm.; width of

mesothorax, 0.31 mm. to 0.36 mm.; greatest width of abdomen, 0.38 mm. to 0.41 mm. Color of head and thorax rather light brown, abdomen usually very dark brown, in some specimens almost black, at tip much lighter. Entire body, together with the legs, showing reticulating chitinous thickenings over a good share of its surface. These are heaviest on the head, the sides of the pterothorax, the sides of the dorsum of the abdomen, and on the femora. Head fully one and one-half times as wide as long, outline very irregular and rough; cheeks rather bulging behind the eyes, slightly notched a little behind the middle. Eyes protruding somewhat, the two together occupying nearly one-half the width of the head. Ocelli large and yellow in color, the posterior pair widely separated from the borders of the eyes; all margined inwardly by dark reddish crescentic pigmentation. Dorsal surface of head with a rather strong conspicuous spine in front of each posterior ocellus; there are three other less conspicuous spines on each side of the dorsal surface behind the eyes, and the extreme sides of the head bear still others. Dorsal surface of head strongly reticulated except toward the posterior margin. Frons not reticulated; bearing a considerable number of rather conspicuous spines; in front there is a single spine on each side not far from the base of the antenna; on each side, almost straight behind these, there is a single similar one not quite back to the middle of the eye; behind these, on each side close to the margin of the eye, there are two similar spines; several others like these are present toward the posterior margin of the frons. Mouth cone not reticulated, pointed, but with broadly rounded labium, reaching to the anterior border of the mesosternum. Maxillary palpi two segmented, the second segment nearly twice as long as the first. Antennæ about two and one-fifth times as long as the head, their bases separated by about twice the thickness of the basal segment. Relative lengths of segments as follows:

1	2	3	4	5	6	7	8
$\frac{1}{5.7}$	$\frac{2}{11}$	$\frac{3}{14}$	$\frac{4}{17.8}$	$\frac{5}{10.8}$	$\frac{6}{7.3}$	$\frac{7}{3.3}$	$\frac{8}{7.5}$

Segment one short cylindrical; two much the thickest, reticulated and constricted at the base; three and four modioliform; five narrow at base but broad at distal end where it is quite squarely cut off; six abruptly constricted at base, narrowest at distal end; seven considerably thicker at base than at apex; eight slender and tapering gradually to apex, where it bears a single very long slender bristle. Segments one and two brown; three light translucent, slightly tinged with grayish brown on the distal half; four light translucent, slightly tinged with grayish brown about the middle; basal half of five light translucent, shading into brown on distal half; six brown; seven and eight light grayish brown.

Spines on the six basal segments for the most part very long, dark colored and conspicuous; those on the third, fourth, and fifth segments especially so; the conspicuous spines on these three segments arise from somewhere near around the middle of the segments. The third and fourth segments each bear prominent and well-developed forked sense cones.

Prothorax transverse, only about two-thirds as long as the head but from two to two and two-thirds times as wide as it is long; rounded at the angles; rather suddenly constricted in front; surface finely cross striated; on the extreme sides of the anterior margin there is a single noticeable rather short curved spine on each side; also near this margin, on each side of the dorsum, there is a single noticeable spine at some little distance from the middle line; near each posterior angle there is another similar spine, and near the hind margin on each side of the middle line there is still another. Mesothorax strongly reticulated on the sides; mesoscutum with a pair of noticeable spines on each side, placed toward the extreme sides, the hinder one of each pair being somewhat the smaller; on each side of and at some distance from the middle there is another pair of spines, the hinder spine of each pair being stronger than the anterior one and placed at a greater distance from the middle line. Surface of mesoscutum finely cross striate like the pronotum; mesosternum not reticulated except on its extreme sides; metathorax slightly narrower than mesothorax; metascutum strongly reticulated with a small but noticeable spine on each side almost on the anterior margin and not very far from the angles; there is also a pair of very conspicuous spines, one on each side, at about the middle of the median triangular portion. Sides of metathorax strongly reticulated; metasternum not reticulated except on extreme sides. Endothoracic invaginations of metathorax extending forward slightly into the mesothorax. Fore wings uniform brown in color, reaching to or beyond the end of the abdomen; rather slender (about thirteen times as long as they are wide in the middle) but apparently quite powerful; hind fringes very long, more than one-half as long as the wings themselves, concolorous with the wings as are also the scales.

Spines on veins long and stout, dark colored and set at uniform distances except toward the tip of the wing where they are less regular and farther apart; the costa bears thirteen or fourteen, fore vein ten to twelve, hind vein ten or eleven, scale three or four besides a pair at its tip. Anterior fringe of fore wings of strong but not very long hairs, concolorous with the spines on the veins, much darker brown than the wings themselves. Hind wings with their outer halves strongly tinged with brown but with their basal halves light and clear; with a very noticeable vein of a darker color than the remainder of the wing running down the middle of each; both fore

and hind fringes very strong, concolorous with the hind fringes of the fore wings. Legs rather short and thick, the fore pair shortest and hind pair longest. Coxæ and femora brown; tibiæ brown at base but shading out more or less to very light translucent yellow at distal ends; posterior tibia armed with a pair of stout spines at the tip; tarsi all light colored; coxæ, femora, and tibiæ all reticulated, the femora very strongly so, and bearing strong spines.

Abdomen rather elongate-ovate, pointed at tip; reticulated but little on the middle of the dorsal segments but very strongly so on the sides and on the pleural plates; ventral surface not reticulated. Across each of the second to eighth dorsal plates, inclusive, somewhat back from its anterior margin, runs a very noticeable irregular thickening. On the hinder margin of the eighth dorsal plate is a transverse row of long comb-like teeth, which, on account of their color, are very inconspicuous and can only be seen with difficulty even with the high powers of the microscope. On each side of each of the second to eighth ventral plates inclusive are three very noticeable spines, placed at about the middle of the segment. There are conspicuous spines on nearly all the dorsal segments; those on segment ten being for the most part small and weak; while those near the posterior dorsal margin of segment nine are very large and strong. The areas on the dorsal plates, which are not reticulated, bear numerous minute spines. Abdomen much darker colored than head or thorax, usually with the tip much lighter, the apical segment being about as light as the thorax. In many specimens a band of bright red hypodermal pigmentation is to be seen in segments one, two, and three of the abdomen; in nearly all specimens a small patch of similar pigment is noticeable at the tip of segment ten and usually protruding somewhat from it. Redescribed from seven specimens. I have redescribed this sex as Giard's description does not seem to be sufficiently complete.

Male.—Length, 1.07 mm.; width of head, 0.18 mm.; width of prothorax, 0.17 mm.; width of mesothorax, 0.28 mm.; width of metathorax, 0.25 mm.; greatest width of abdomen, 0.24 mm. General color much like that of female. Relative lengths of antennal segments:

1	2	3	4	5	6	7	8
5	10	13	15.5	8.5	7	4	9

Wings relatively shorter than in the female, not reaching the end of the abdomen. Abdomen blunt at the end, with two pairs of very large and characteristic dark-colored spines on the posterior part of the dorsum of the ninth segment, the smaller of these two is situated immediately behind the larger and the spines of both pairs are close together, one on each side of the middle line of the abdomen.

On each of the third to seventh ventral abdominal plates, inclusive, there is a single round very noticeable median spot or marking of a slightly lighter color than that of the surrounding integument located near the anterior margin of the segment. The abdomen is constricted slightly and broadly in front of the ninth segment. The reticulated areas on the abdomen have about the same arrangement as in the female.

Described from a single specimen (presumably the type of this sex, as Giard appears to have described only the female) deposited in the collection of the Massachusetts Agricultural College.

Specimens taken on St. Vincent Island, British West Indies, on cacao and kola. Found in colonies on leaves and flowers.

Larva.—At least in their later stages the larvæ are bright yellow with a wide bright red hypodermal pigment band running across the base of the abdomen on the upperside and with the abdomen tipped with bright red on account of the hypodermal pigment. The posterior corners of some of the intervening segments are also often touched slightly with red. Head also usually irregularly mottled more or less, especially about the eyes with reddish or orange pigment.

Mature nymph.—Length, about 0.92 mm.; width of thorax, about 0.27 mm.; greatest width of abdomen, about 0.37 mm. Colored in general like the adult insect but lighter as a rule, especially the abdomen; the band of red pigment at the base of the abdomen is quite noticeable. Shape more chunky than that of the adult, the segments of the body being drawn closely together. Wings rather darker than in adult. Red pigment at apex of abdomen conspicuous. The wing pads reach to about the seventh segment.

This species was originally described by Giard as *Physopus rubrocincta*, but its structure places it very clearly in the genus *Heliothrips*. It is a great pest on cacao in the West Indies, having been reported from Grenada, St. Lucia, Dominica, and Guadeloupe. It is said to have the cashew tree, the guava, and the Liberian coffee among its food plants. While apparently closely allied it does not seem to be the same species of Thrips, which has been reported as injurious to cacao in Ceylon. The following references concerning this insect are important:

1. Giard, A., Bull. Soc. de France, 1901, pp. 263–265. (Original description.)
2. West Indian Bulletin, II, 1901, pp. 175–180. (Figs. 1, 2.) (Treatment discussed.)
3. West Indian Bulletin, II, 1901, pp. 288–289.
4. Ballou, H. A., West Indian Bulletin, VI, 1906, pp. 94–97.
5. Elot, A., Compt. Rend, Soc. Biol. Paris, LIX, pp. 100–102.

Family PHOEOTHRIPIDÆ.

Five species represent this family, as follows:

1. ANTHOTHRIPS GOWDEYI, new species.

Plate LXIII, fig. 8; Plate LXIV, figs. 15, 16; Plate LXV, fig. 23.

Female.—Length, 1.01 mm. to 1.73 mm.; width of head, 0.14 mm. to 0.20 mm.; width of mesothorax, 0.21 mm. to 0.33 mm.; greatest width of abdomen, 0.21 mm. to 0.35 mm. General color deep brown, appearing irregularly mottled more or less with dark reddish or purple hypodermal pigmentation, especially the thorax.

Head of about equal length and breadth, yet often somewhat wider behind than in front; cheeks straight or very slightly bulging behind the eyes. Vertex somewhat elevated between the bases of the antennæ. Dorsal surface finely cross striated. Eyes small, finely faceted; ocelli quite large, much larger than the facets of the eyes, and well separated, bordered medially by dark red pigment crescents; anterior ocellus placed far forward, almost touching the bases of the antennæ; posterior ocelli touching margins of eyes. Post-ocular bristles long and knobbed at the end. Mouth cone reaching to the middle of the prosternum, pointed, but with bluntly rounded labium. Antennæ about one and one-half times as long as the head, with bases set very closely together. Relative lengths of segments as follows:

1	2	3	4	5	6	7	8
6.8	9.8	10.8	12.2	11.8	9.3	8.9	6.4

Most of the segments quite thick for their length, the fourth being slightly thicker than any of the others, the third next thickest. Segment one truncate, conical; two constricted toward the base into a broad stalk, cut off squarely at end; three slenderly stalked at base, rather broadly rounded; four elliptical in general form, constricted at base to form a broad stalk; five and six oval in outline and also constricted at bases to form stalks; seven barrel-shaped; eight conical. Segments one and two deep brown; three and four yellow; five yellow but slightly tinged with brownish on distal half; six light brownish yellow; lighter at base; seven and eight deep brown, concolorous with the two basal segments. Spines weak; sense cones short, but mostly rather sharp pointed.

Prothorax subequal in length with the head; broader behind than in front; fore and hind margins nearly parallel, gently curved; pronotum bears on each side of its front part a pair of spines; of its middle portion, a single spine; of its hind portion, a pair of spines; all these are conspicuous and knobbed. Mesothorax somewhat wider than prothorax; sides of pterothorax nearly straight, but metathorax

narrowing slightly posteriorly; fully as wide as it is long. Legs rather long and slender; fore femora only slightly thickened; fore tarsi one segmented and armed with a tiny tooth within. All the coxæ and femora and the middle and hind tibiæ and tarsi are brown in color, the tarsi being, however, somewhat lighter than the other segments; anterior tibiæ brown at base but shading to yellow at apex; fore tarsi yellow but with a dark colored spot on the inside of the apical portion. Near the base of each posterior and middle femur below and of each anterior femur in front is a single long slender spine. Wings present, narrowed in middle, transparent; the fore pair slightly stained with brownish or yellowish at the base, where they bear three long, knobbed spines on the remnant of the single median vein. Scale light brown. Fringes long, single, except near end of hind fringe of fore wing where it is double for five or six hairs. The front fringes of the fore wings are if anything longer than their hind fringes, and the hind fringes of the hind wings are longer than their front fringes.

Abdomen at base slightly wider than the pterothorax to which it is broadly joined, widest at base, tapering gradually to the tube. Tube about two-thirds as long as the head, tapering slightly; somewhat more than one-half as wide at the apex as it is at the base; on the ventral side of the abdomen a strong chitinous rod runs forward a short distance from the base of the tube; some of the hairs at the end of the tube as long or longer than the tube itself. Spines on abdomen, for most part, slender, rather faint and inconspicuous, not knobbed; abdomen as a rule lighter brown in color than the rest of the body.

Type.—Cat. No. 11361, U.S.N.M.

Described from 21 females (cotypes), of which 10 (three slides) are deposited in the collection of the United States National Museum and 11 (three slides), besides numerous paratypes, in that of the Massachusetts Agricultural College. Of this species there were 31 specimens in all in the collection, all females. Male unknown.

Food plants.—*Euphorbia*, date palm, *Crotolaria*, morning glory. Usually on flowers, often in colonies.

Specimens taken at Glendor, Belle, and Bellevue, St. Michael, and Cane Garden, St. Thomas, Barbados. Dates of capture ranging from July 21 to August 24. This species appears to have its closest ally in *A. aculeata* (Fabricius) of Europe.

2. TRICHOTHRIPS NIGER, new species.

Plate LXIII, figs. 4, 9; Plate LXIV, fig. 11; Plate LXV, figs. 18, 22.

Female.—Length, 2.19 mm.; width of head, about 0.27 mm.; width of mesothorax, about 0.47 mm.; greatest width of abdomen,

about 0.60 mm.; width of tube at anterior end, about 0.098 mm., at posterior end, about 0.047 mm. General color dark brown; abdomen, except toward base and at tip of tube, black.

Head between one and one-fifth and one and one-sixth times as long as it is wide; somewhat widest just behind the eyes, nearly as wide at the posterior end, squarish in front; cheeks nearly straight, slightly bulging, set with scattered small, stout spines borne upon small warts; frons slightly elevated between the bases of the antennæ; post-ocular bristles present and of good length, acute. Eyes small, finely faceted, not pilose, rounded, black by transmitted but dark red by reflected light; ocelli present, well separated, placed far forward on the head, distinctly larger than the facets of the eyes. Mouth cone reaching nearly to the posterior edge of the prosternum; labium broadly rounded at the end; maxillary palpi two segmented, the basal segment very short and rounded. Antennæ eight segmented, with joints all distinct; nearly one and three-fourths times as long as the head. Relative lengths of segments as follows:

1	2	3	4	5	6	7	8
$\frac{1}{10}$	$\frac{2}{14}$	$\frac{3}{24.2}$	$\frac{4}{24.9}$	$\frac{5}{22}$	$\frac{6}{16.3}$	$\frac{7}{11.4}$	$\frac{8}{9}$

Segment one cylindrical, truncate; two constricted toward base into a broad stalk, cut off squarely at end; three to six clavate; seven cylindrical ovate; eight conical. Color of one and two brown, the latter lighter toward the apex; three yellow; four yellowish brown at base, shading into darker brown toward the apex; five brown, lightest at base; six, seven, and eight very dark brown. Sense cones fairly long; spines, for most part slender and weak.

Prothorax about three-fifths as long as the head; fore coxæ projecting considerably beyond posterior angles and forming what appear to be the prominent sides of the prothorax. On account of the dark color of the type specimen it is difficult to make out exactly where the prominent spines are placed on the pronotum, but it is certain that there is one on each side, somewhat removed from the middle line, close to the anterior margin; there is also a very prominent one on each posterior angle; somewhat in front of the hind margin, about half way from the corner to the middle line on each side is still another; yet another is situated on each side somewhat in front of the middle and well toward the side margin; almost directly in front of this, on each side somewhat back from the front margin, another is noticeable. Mesothorax distinctly wider than the prothorax. Pterothorax concolorous with the prothorax, somewhat lighter than the head. Mesoscutum, metascutum, metascutellum, and pleuræ somewhat reticulated. Legs rather long and slender, the middle pair much the smaller; each fore coxa bears a single long and rather stout spine on its outer side; fore femora rather strongly en-

larged; each fore and middle femur bears a single very long erect and slender spine in front near its base; each hind and middle tibia bears a similar long, slender, erect spine on its outer side toward its apex; each fore tibia bears two or three such spines, similarly located; fore tarsi armed with a strong tooth. All the coxæ and femora and the middle and hind tibiæ deep brown in color; posterior tarsi lighter brown than tibiæ; middle tarsi light yellowish brown; fore tibiæ light brown at base and quickly shading out into yellow; fore tarsi yellow with a noticeable dark spot on the inside of the apical portion; middle tarsi with a similar dark spot on the inside of the apical portion. Wings with their fringes not reaching the base of the tube; fringes long and heavy, rather dark brown in color, double for several hairs on hind border of fore wing near the tip. Wings clear transparent.

Abdomen broad and heavy, elongate ovate in outline, considerably wider at the middle than at the base, widest at the fourth segment; segments telescoped about two-fifths. Tube nearly as long as the head, some of the terminal spines nearly as long as the tube. Spines on apical segments as a whole long, rather slender, yellowish. The sides of the tube bear at intervals rather minute but conspicuous dark-colored spines.

Described from one female (the type) deposited in the collection of the Massachusetts Agricultural College.

Male unknown.

Specimen taken at Newstead, St. Peters, Barbados, on flower of La France rose, July 31.

3. CEPHALOTHRIPS YUCCÆ Hinds.

This species has heretofore been reported only from Amherst, Massachusetts, and Washington, District of Columbia. There are two specimens in the collection from Barbados collected July 10 on flowers of *Hibiscus* at Pine Estate, St. Michael.

4. CRYPTOTHRIPS ASPERSUS Hinds.

This has, up to this time, been recorded from Amherst, Massachusetts, only. In the collection from Barbados it is represented by eight females and five males. These were collected on July 21 and 22 at Glendor and Bellevue, St. Michael, and Cane Garden, St. Thomas, on *Solanum*, morning glory, and *Crotolaria*; for the most part from the flowers, where they were solitary.

5. CRYPTOTHRIPS FASCIAPENNIS, new species.

Plate LXIV, figs. 12, 13.

Female.—Length, 1.96 mm.; length of head, 0.19 mm.; length of antenna, 0.35 mm.; width of head, 0.19 mm.; width of mesothorax,

0.33 mm.; width of abdomen, 0.34 mm. General color brown; body irregularly mottled more or less with dark reddish hypodermal pigmentation, especially in the head and thorax.

Head squarish, slightly narrower in front than behind; cheeks straight; front produced considerably between the bases of the antennæ; post-ocular bristles absent; frons bearing a very long spine on each side at about the middle of the eye and not far removed from its border; eyes rather small, together occupying about one-half the width of the head; ocelli present, the lateral ones placed rather closely to the margins of the eyes and not larger than their largest facets, anterior one not on the apex of prolonged vertex of head; mouth cone short, blunt and thick, reaching somewhat beyond the middle of the prosternum; labium broadly rounded; maxillary palpi two segmented, the basal segment being short and cylindrical and the apical one rather long and slender. Antennæ borne on somewhat produced front of head; their bases separated by about one-half the width of their basal segment. Relative lengths of segments as follows:

1	2	3	4	5	6	7	8
$\frac{1}{10.5}$	$\frac{2}{12}$	$\frac{3}{20}$	$\frac{4}{18}$	$\frac{5}{16}$	$\frac{6}{15}$	$\frac{7}{10}$	$\frac{8}{10.1}$

Second, fourth, and fifth segments thickest; one cylindrical; two constricted somewhat at base, truncate at apex; three very narrow at base, clavate; four, five, and six clavate; seven cylindrical; eight long conical. The four basal segments yellow; five yellow at base but somewhat shaded with brown at apex; six yellowish brown at base, apical two-thirds strongly shaded with brown; seven and eight deep brown. Spines slender and weak; sense cones simple, one on segment three and two each on segments four and five, rather long and blunt pointed.

Prothorax considerably wider than and about two-thirds as long as the head. On or near each anterior and posterior angle there is a rather short but conspicuous knobbed spine; all other spines inconspicuous. Pterothorax with sides nearly straight and parallel. Legs medium to rather long and slender; fore pair the shortest, hind pair the longest; fore femora somewhat thickened; fore tarsi unarmed; each fore femur with a long, slender, erect spine toward the base within. Wings rather short and weak but with long, heavy, dark colored fringes; fore pair light brown in color with a transparent cross band somewhat before the middle and another similar one just before the tip; hind wings apparently entirely clear.

Abdomen rather long and slender, cylindrical to about the anterior margin of the seventh segment, from which it tapers to the tube. Tube slightly more than two-thirds as long as the head, swollen somewhat toward the base; some of the terminal hairs nearly as long as the tube. Spines on sides and toward the tip of abdomen long, rather

slender, knobbed, very conspicuous, and toward the base of abdomen shorter and less prominent. There are two of these knobbed spines on each side of segments two to nine, inclusive; on the posterior segments these spines are rather close together, but on the anterior ones rather widely separated, the inner ones being placed more than half way from the extreme sides to the middle line; on each side of the middle line of dorsal segments two to six, inclusive, is placed a single, rather short, conspicuous, acute, double-curved spine. The surface of dorsal segments two to seven, inclusive, is reticulated.

Described from one specimen (the type) deposited in the collection of the Massachusetts Agricultural College.

Male unknown.

Specimen captured at Glendor, St. Michael, on leaf of lime, July 15.

This species is, in some ways, rather abnormal for *Cryptothrips*, and possibly a new genus should be erected for it, but I think it better for the present at least to leave it as a member of that genus.

Herr H. Karny, in his paper Die Orthopterenfauna des Küstengebietes von Österreich-Ungarn,^a has incorrectly used the genus name *Physapus*. This name can not be applied to species of Thysanoptera, as it was first used by Leach for a genus of the Neuroptera as Doctor Hinds has made clear. He has further erred in using the name *ater* for *E. vulgatissimus* (Haliday), as *ater* was used by Degeer not as a specific name but as a part of a description.

^a Berl. Entom. Zeitschr., LII, 1907.

EXPLANATION OF PLATES.

PLATE LXIII.

- Fig. 1. *Euthrips insularis*, new species. Dorsal view of end of abdomen of female. $\frac{15.8}{1}$.
2. *Euthrips insularis*, deformed antenna of female. $\frac{10.9}{1}$.
3. *Euthrips insularis*, head, prothorax, antennæ, and forelegs of female. $\frac{10.9}{1}$.
4. *Trichothrips niger*, new species. Antenna of female. $\frac{15.8}{1}$.
5. *Euthrips insularis*, face of female. $\frac{9.9}{1}$.
6. *Euthrips insularis*, fifth ventral abdominal segment of female. $\frac{5.8}{1}$.
7. *Euthrips insularis*, end of abdomen of male. $\frac{15.8}{1}$.
8. *Anothrips gowdeyi*, new species. Head, prothorax, antennæ, and forelegs of female. $\frac{15.8}{1}$.
9. *Trichothrips niger*, tube of female. $\frac{10.9}{1}$.

PLATE LXIV.

- Fig. 10. *Heliothrips rubrocinctus* (Giard). Head, prothorax, antennæ, and forelegs of female. $\frac{16.5}{1}$.
11. *Trichothrips niger*, foreleg of female. $\frac{10.5}{1}$.
12. *Cryptothrips fasciapennis*, new species. Head and antennæ of female. $\frac{10.5}{1}$.
13. *Cryptothrips fasciapennis*, end of abdomen of female. $\frac{10.5}{1}$.
14. *Heliothrips rubrocinctus*, left fore wing of female. $\frac{7.3}{1}$.
15. *Anothrips gowdeyi*, left fore wing of female. $\frac{7.3}{1}$.
16. *Anothrips gowdeyi*, dorsal view of end of abdomen of female. $\frac{10.5}{1}$.

PLATE LXV.

- Fig. 17. *Heliothrips rubrocinctus*, ventral view of pterothorax of female. $\frac{10.5}{1}$. *e*, endothoracic invaginations; *m*, mesosternum; *t*, metasternum.
18. *Trichothrips niger*, ventral view of pterothorax of female. $\frac{7.3}{1}$. *e*, endothoracic invaginations; *m*, mesosternum; *t*, metasternum.
19. *Euthrips insularis*, right fore wing of female. $\frac{7.9}{1}$.
20. *Heliothrips rubrocinctus*, dorsal view of end of abdomen of female. $\frac{10.5}{1}$.
21. *Heliothrips rubrocinctus*, dorsal view of end of abdomen of male. $\frac{10.5}{1}$.
22. *Trichothrips niger*, head of female. $\frac{7.3}{1}$.
23. *Anothrips gowdeyi*, ventral view of pterothorax of female. $\frac{10.5}{1}$. *e*, endothoracic invaginations; *m*, mesosternum; *t*, metasternum.
24. *Euthrips insularis*, ventral view of pterothorax of female. $\frac{10.5}{1}$. *e*, endothoracic invaginations; *m*, mesosternum; *t*, metasternum.



Franklin, Henry J. 1908. "On a collection of Thysanopterous insects from Barbados and St. Vincent Islands." *Proceedings of the United States National Museum* 33, 715–730.

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